Insomnia Disorder
A Journey to the Land of No Nod

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Objectives

1. Identify the prevalence, symptoms, and sequelae of Insomnia Disorder.

2. Apply a basic framework to conceptualize Insomnia Disorder, particularly in the context of other sleep disorders seen in the sleep lab.

3. Understand the fundamental components of Cognitive Behavioral Therapy for Insomnia (CBT-I).
Insomnia
God... I’m too tired to keep going...

Life’s too short. I should be working. So many ideas!
Do you know that awesome feeling when you get into bed, fall right to sleep, stay asleep all night, and wake up feeling refreshed?

Me neither
Diagnostic Criteria

DSM-5

- Difficulty initiating sleep
- Difficulty maintaining sleep
- Early morning awakening

- > 30 minutes of wakefulness
- ≥ 3x/week
- ≥ 3 months

- Occurs despite adequate opportunity for sleep
- Causes clinically significant distress or impairment in important areas of functioning

DSM-5; American Psychiatric Association, 2013
Daytime Impairment

- Fatigue or malaise
- Attention, concentration, memory impairment
- Social or vocational dysfunction
- Poor school performance
- Mood disturbance or irritability
- Daytime sleepiness
- Motivation, energy, or initiative reduction
- Proneness for errors or accidents at work/while driving
- Tension, headaches, or gastrointestinal symptoms in response to sleep loss; concerns or worries about sleep
How do we assess?

- Sleep Diaries
- Sleep Continuity
  - Total Sleep Time
  - Sleep Latency
  - Wake After Sleep Onset
  - Number of Awakenings
  - Sleep Efficiency
- Insomnia Severity Inventory
- Actigraphy
- Measures of Daytime Functioning (e.g., Sleepiness, Fatigue, Mood)
Why do we care?

Insomnia is a risk factor for:

- Hypertension
- Diabetes
- Cardiovascular Disease
- Obesity
- Substance Abuse
- Depression
- Suicide

- approximately 3-fold likelihood of suicide ideation, attempts, and death by suicide

Prevalence

- ~30-50% experience sleep continuity complaints
- ~6-10% Insomnia Disorder
- Women have insomnia nearly 2x rate compared to men
- Older adults have insomnia nearly 2-3x rate compared to younger adults
- Familial/genetic risk factors likely
- Low SES

Common Comorbidities

- **Psychiatric Comorbidities**
  - Anxiety, Depression, PTSD, ADHD, Substance Use
  - Up to 90% of individuals with MDD have Insomnia

- **Medical Comorbidities**
  - 2-4x higher among individuals with medical comorbidities

- **Sleep Disorder Comorbidities**
  - Circadian Rhythm Disorder
  - Obstructive Sleep Apnea
  - Restless Legs Syndrome
  - Nightmare Disorder

How do we conceptualize comorbidities?

- **Differential Diagnosis**
  - Insomnia shares common complaints with other sleep disorders (e.g., OSA, RLS, DSPD) warranting careful assessment of both conditions
  - Pts may self-diagnose insomnia and minimize symptoms of other disorder (e.g., OSA) or vice versa

- **Overlapping and interacting symptoms**
  - DSPD Example

- **Safety**
  - Insomnia patients who exhibit high levels of sleepiness (drowsy driving) require sleep studies

- **Costs/Benefits**
  - Exacerbation of symptoms if a condition left untreated
  - Sequencing of symptoms
Insomnia and OSA

- Prevalence is high (30-70%)
- Interactive effects of each dx warrant attention
- Insomnia is not merely a symptom of OSA
- Individuals with OSA and INS, compared with OSA alone, display:
  - Lower TST, SE; Higher WASO
  - Greater depression, anxiety, stress, sleepiness, functional impairment
- Untreated insomnia may contribute to
  - CPAP rejection or low adherence
  - Blaming trouble with CPAP (SL and WASO may not improve); patients may attribute lack of success to CPAP vs. another underlying condition (aka insomnia)
  - Worse treatment outcome for OSA
- Untreated apnea may contribute to:
  - Refractory insomnia may call for SRBD eval and treatment

Many patients with sleep disorders may also present with Insomnia Disorder

- Insomnia does not always automatically resolve with tx of other dx

Suitability of CBT-I for patients with excessive sleepiness has to be carefully determined

Consider treating the INS before or concurrently with CPAP, while remaining mindful of safety of severity issue

CBT-I can be enhanced with knowledge of other sleep disorders contributing to insomnia (OSA, DSPD)
What causes insomnia?

“I have a theory about your insomnia...”
Theories of Insomnia

ETIOLOGY OF INSOMNIA - PARALLEL PROCESSES (TRANS-THEORETICAL) MODEL

GOOD SLEEP CONTINUITY
NORMAL SLEEP ARCHITECTURE
AS NEEDED TOTAL SLEEP

PREDISPOSING FACTORS
PERSONALITY TRAITS
POOR SLEEP HYGIENE
PRIOR INSOMNIA
SOCIAL FACTORS
ENVIRONMENT
RACE / GENDER / AGE
CONDITIONABILITY?

COGNITIVE BEHAVIORAL DOMAIN

PSYCHOSOCIAL STRESS
PERCEIVED OR REAL
THREAT TO LIFE OR WELL BEING

INCREASED
SL, NWAK OR WASO
REDUCED TST
REDUCED SWS?
REM INSTABILITY?

DYSFUNCTIONAL BELIEFS ABOUT SLEEP
SELECTIVE ATTENDING
ATTENTIONAL BIAS
TO & DETECTION OF
SLEEP "THREATS" &
DAYTIME CONSEQUENCES
APPRAISAL OF SLEEP AND
DAYTIME FUNCTIONING
SLEEP RELATED WORRY
SLEEP PREOCCUPATION

REMAIN IN BED AWAKE
NON-SLEEP BEHAVIORS IN
THE SLEEP ENVIRONMENT
ENGAGEMENT OF SAFETY BEHAVIORS &
SLEEP EFFORT
EXTENDED SLEEP OPPORTUNITY
ALTERED EXPOSURE TO
LIGHT DURING THE SLEEP
PERIOD

REMIND IN BED AWAKE
NON-SLEEP BEHAVIORS IN
THE SLEEP ENVIRONMENT
ENGAGEMENT OF SAFETY BEHAVIORS &
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EXTENDED SLEEP OPPORTUNITY
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PERCEPTUAL BEHAVIORAL
DISENGAGEMENT
NORMAL MESOGRADE
AMNESIA OF SLEEP
AUTOMATICITY
PLASTICITY

NEUROCOGNITIVE & NEUROBIOLOGIC DOMAIN

GENETIC DEVELOPMENTAL
DETERMINANTS OF
SLEEP REQUIREMENT
&
DEGREE OF PLASTICITY
BADAL METABOLIC RATE

FLIGHT-FIGHT RESPONSE
↑ CRH, ACTH
↑ NE
↑ EPI
↑ DA?
↑ CORTISOL

HYPERAROUSAL
INHIBITION OF SLEEP RELATED
DE-AROUSAL
↑ CRH, ACTH
↑ NE
↑ EPI
↑ DA?

LOCAL NEURONAL WAKEFULNESS DURING
NREM

↑ CORTISOL
↑ ACh?
↑ DA?

HOMEOSTATIC & CIRCADIAN
DYSREGULATION

↑ OX?
↑ M17?
↑ ACh
↑ DA?
↑ CORTISOL
↑ ADENOSINE

SLEEP STATE MISPERCEPTION
PAVLIOAN CONDITIONING

NORMAL SLEEP
ACUTE
SUBCHRONIC
CHRONIC

ADAPTIVE

ADAPTIVE
MALADAPTIVE

THESE BOXES ARE HIGHLIGHTED / GRAYED BECAUSE THE NEUROBIOLOGIC MECHANISMS ARE NOT DILEINATED.

Perlis, ML, Ellis, JG, Kloss, JD, Reimann, DW. Etiology and pathophysiology of insomnia. PPSM, Chapter 82.
Why should we treat insomnia?

- Most common sleep disorder and one of the most common sleep complaints to primary care docs
- Risk factor for multiple medical and psychiatric conditions
- Adversely affects safety, health, performance and QOL
- Responsible for billions of dollars in public health costs
- Insomnia is modifiable!
- Treatment (CBT-I) is safe and effective
- Treatment of insomnia disorder can also enhance treatment of other disorders (e.g. MDD)

How do we get to the Land of Nod?

- Cognitive Behavioral Therapy for Insomnia (CBT-I)
- Pharmacotherapy
What is Cognitive Behavioral Therapy for Insomnia (CBT-I)?

- 4-8 sessions aimed at teaching behavioral and cognitive strategies that significantly improve sleep continuity and daytime functioning

- Meta-analysis of randomized, controlled trials (RCTs): CBT-I has moderate to large effect on improving sleep based on both subjective and objective measures

- As effective as prescription medications and better long-term outcomes than medications in both younger and older adults

- Effective in ~ 80% of cases; works in older adults

- Effective with patients who have medical and psychiatric comorbidities

Components of CBT-I

- Sleep Hygiene
  - Stimulus Control
  - Sleep Restriction
- Cognitive Therapy
- Mindfulness Strategies
- Relaxation Therapy
Sleep Hygiene
Stimulus Control ~ Pavlov’s Dog
Stimulus Control Instructions

1. Go to bed only when you are feeling sleepy and are ready to sleep.

2. Use the bed only for sleep and sex.

3. If you cannot fall asleep after 15-20 minutes, get out of bed. Stay out of bed until you become sleepy. Only return to bed once you are sleepy.

4. If you still cannot sleep, repeat Rule 3.

5. In order for your body to establish a consistent rhythm, which will help you fall asleep each night, set an alarm and get up at the same time every morning, no matter how much you slept the night before.

6. Do not take naps during the day.

Sleep Restriction
Sleep Restriction

- Mismatch Sleep Ability:: Sleep Opportunity

- Goal = Efficiency (≥ 85%)
- Match Sleep Ability::Opportunity

- Build Homeostatic Pressure

\[
\text{the total time sleeping in bed} \times 100 = \frac{7 \times 100}{9} = 78% \\
\text{the total time spent in bed} = \frac{7 \times 100}{7} = 100%
\]

Cognitive Therapy

SOMETIMES I LIE AWAKE ALL NIGHT WORRYING ABOUT INSOMNIA
Generating Alternative Interpretations

- Enlist patient as a scientist
- Re-evaluate unhelpful thoughts about sleep; help pt generate helpful thoughts about sleep
  - There is no gold standard of sleep to function
  - You will be able to function, maybe at 75% vs. 90%
  - You have functioned quite well with little sleep
What about pharmacotherapy?

I guess I better get both...
## FDA Approved Medications for Insomnia

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
<th>Common Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzodiazepines</td>
<td>Temazepam</td>
<td>Confusion; headache; next day drowsiness; dizziness; nausea; daytime nervousness</td>
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<td></td>
<td>Triazolam</td>
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<tr>
<td>Nonbenzodizepines</td>
<td>Eszoplicone</td>
<td>Headache; dry mouth; unpleasant taste; drowsiness; dizziness;</td>
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<td></td>
<td>Zolpidem</td>
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<td></td>
<td>Zaleplon</td>
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<tr>
<td>Melatonin Receptor Agonists</td>
<td>Ramelteon</td>
<td>Dizziness; somnolence; nausea; insomnia exacerbation</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>Doxepin</td>
<td>Somnolence; some contraindications</td>
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# Points to Consider about Sleep Aids

<table>
<thead>
<tr>
<th>Should I?</th>
<th>Shouldn’t I?</th>
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</thead>
<tbody>
<tr>
<td>Fast-acting, immediate relief</td>
<td>“Hangover” effect/morning drowsiness</td>
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<tr>
<td>Reliable, easy to use</td>
<td>Tolerance &amp; withdrawal</td>
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<td>Available, FDA-approved</td>
<td>Risk of falls and many other side effects (felt into the next day)</td>
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<td>Belief that there is no other option*</td>
<td>There are other options!</td>
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<td>Nothing replaces natural sleep!</td>
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*Best to discuss with primary care or prescribing physician*
Conclusions

- Insomnia is a 24 hr condition
- Insomnia confers risk to health, safety and performance
- Insomnia is prevalent and commonly comorbid with other medical, psychiatric, and sleep conditions
- Insomnia is not merely a symptom of other sleep disorders or conditions
- CBT-I is the frontline treatment for insomnia
- Treatment of insomnia can enhance outcomes of other conditions
Robert Louis Stevenson

“From breakfast on through all the day,
At home among my friends I stay,
But every night I go abroad
Afar into the land of Nod....”

Wishing you and your patients a journey to the land of Nod!